

Amendments to the Claims :

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims :

1-24. (Cancelled)

25. (Withdrawn) A method of screening a test nucleic acid sequence to identify a candidate nucleic acid sequence encoding an antimicrobial peptide, said method comprising:

- (a) identifying an initial peptide of interest;
 - (b) identifying a DNA sequence from a first fish species containing a nucleotide sequence encoding the initial peptide;
 - (c) identifying within the DNA sequence a flanking nucleotide sequence on each side of the peptide-encoding sequence;
 - (d) obtaining a primer oligonucleotide sequence complementary to each flanking sequence; and
 - (e) screening a test nucleic acid sequence from a fish species other than the first fish species to determine whether it is capable of being amplified by PCR using the primers from step (d);
- amplification indicating that the test nucleic acid sequence is a candidate nucleic acid sequence encoding an antimicrobial peptide.

26. (Withdrawn) The method of claim 25 wherein the initial peptide has a net positive charge of at least 2 and has an amphipathic structure.

27. (Withdrawn) The method of claim 25 wherein the initial peptide is selected from the group consisting of a hepcidin, a pleurocidin, a pardaxin, a misgurin, HFA-1, a piscidin, a moronecidin, and a cleavage product of histone 2A from catfish.
28. (Withdrawn) The method of claim 27 wherein the cleavage product of histone 2A is a parasin.
29. (Withdrawn) The method of claim 25 comprising a further step (f) of predicting the amino acid sequence encoded by the candidate sequence and selecting nucleic acid sequences which are predicted to encode peptides having an amphipathic structure and a net charge.
30. (Withdrawn) The method of claim 29 comprising a further additional step of obtaining a peptide corresponding to the candidate nucleic acid sequence and assaying the peptide sequence for antimicrobial activity.
31. (Withdrawn) The method of claim 25 comprising a further step (a') of confirming that the initial peptide has antimicrobial activity.
32. (Withdrawn) The method of claim 25 wherein the initial peptide is a pleurocidin.
33. (Withdrawn) The method of claim 32 wherein at least one of the flanking sequences is selected from the group consisting of a nucleotide sequence

encoding signal sequence I (SEQ ID NO: 305), a nucleotide sequence encoding Acidic Sequence I (SEQ ID NO: 306), GCCCACTTTGTATTCGCAAG (SEQ ID NO: 5) and CTGAAGGCTCCTTCAAGGCG (SEQ ID NO: 6).

34. (Withdrawn) The method of claim 25 wherein the initial peptide is a hepcidin.

35. (Withdrawn) The method of claim 34 wherein at least one flanking sequence is selected from the group consisting of a nucleotide sequence encoding signal peptide II (SEQ ID NO: 307), a nucleotide sequence encoding signal peptide III (SEQ ID NO: 308), a nucleotide sequence encoding signal peptide IV (SEQ ID NO: 309), a nucleotide sequence encoding signal peptide V (SEQ ID NO: 310), a nucleotide sequence encoding prosequence I (SEQ ID NO: 311), a nucleotide sequence encoding prosequence II (SEQ ID NO: 312), ACAACCTCGTCCTTAGG (SEQ ID NO: 313) and ACGCCCGTCCAGGAAT (SEQ ID NO: 314).

36. (Withdrawn) An isolated nucleic acid sequence identifiable using the method of claim 25.

37. (Withdrawn) The nucleic acid sequence of claim 36 wherein the sequence is selected from the group consisting of SEQ ID NOS: 82-124, 129-173 and 327.

38. (Currently amended) An isolated pleurocidin or hepcidin polypeptide that is not found in winter flounder and is capable of being encoded by the nucleic acid sequence identifiable using the method comprising:

(a) identifying an initial peptide of interest selected from the group consisting of a hepcidin and a pleurocidin; a pardaxin, a misgurin, HFA-1, a piscidin, a moronecidin, and a cleavage product of histone 2A from catfish;

(b) identifying a DNA sequence from a first fish species containing a nucleotide sequence encoding the initial peptide;

(c) identifying within the DNA sequence a flanking nucleotide sequence on each side of the peptide-encoding sequence;

(d) obtaining a primer oligonucleotide sequence complementary to each flanking sequence; and

(e) screening a test nucleic acid sequence from a fish species other than the first fish species to determine whether it is capable of being amplified by PCR using the primers from step (d); amplification indicating that the test nucleic acid sequence is a candidate nucleic acid sequence encoding an antimicrobial peptide.

39. (Withdrawn) A kit comprising:

a. a first nucleic acid sequence at least 95 % identical to a first flanking sequence, located at or near a 5' end of a target sequence encoding an antimicrobial peptide;

b. a second nucleic acid sequence at least 95 % identical to a second flanking sequence located at or near a 3' end of a target sequence encoding an antimicrobial peptide; and

c. instructions for carrying out the method of claim 25.

40. (Withdrawn) The method of claim 25, wherein at least one sequence selected from the group consisting of signal sequence I, acidic sequence I, signal peptide II, signal peptide III, signal peptide IV, signal peptide V, prosequence I, prosequence II, nucleic acid sequences encoding them, and nucleic acid sequences substantially complementary to such encoding nucleic acids, is identified.

41. (Withdrawn) An isolated antimicrobial peptide at least 80% homologous to one of peptide a, b, c, d, e or f:

Peptide a GW(G/K)XXFXK (SEQ ID NO: 315),

Peptide b GXXXXXXXXHXGXXIH (SEQ ID NO: 316),

Peptide c FKCKFCCGCCXXGVCGXCC (SEQ ID NO: 317),

Peptide d CXXCCNCC(K/H)XKGCGFCKKF (SEQ ID NO: 318),

Peptide e FKCKFCCGCRGXXCGLCKKF (SEQ ID NO: 319),

Peptide f XXXCXXCCNXXGCGXCCKX (SEQ ID NO: 320).

42. (Withdrawn) The antimicrobial peptide of claim 41 which is at least 90% homologous to one of peptide a, b, c or d.

43. (Withdrawn) The antimicrobial peptide of claim 41 which is one of peptide a, b, c or d.

44. (Withdrawn) A method of screening a test nucleic acid sequence to identify a candidate nucleic acid sequence encoding an antimicrobial peptide, said peptide comprising:

- a) identifying a nucleic acid sequence encoding an initial peptide of interest;
 - (b) identifying a DNA sequence from a first fish species containing a nucleotide sequence encoding the initial peptide;
 - (c) identifying within the DNA sequence a flanking nucleotide sequence on each side of the peptide-encoding sequence;
 - (d) obtaining a primer oligonucleotide sequence complementary to each flanking sequence; and
 - (e) screening a test nucleic acid sequence from a fish species other than the first fish species to determine whether it is capable of being amplified by PCR using the primers from step (d);
- amplification indicating that the test nucleic acid sequence is a candidate nucleic acid sequence encoding an antimicrobial peptide.

45. (Currently Amended) An isolated antimicrobial peptide comprising an amino acid sequence selected from the group consisting of:

- (a) WLRRIGKGVKIIIGGAALDHL (SEQ ID NO: 63);
- (b) GRRKRKWLRRIGKGVKIIIGGAALDHL (SEQ ID NO: 64);
- (c) RWGKWFKKATHVKGKHHVGAALTAYL (SEQ ID NO: 65);
- (d) RSTEDIIKSISGGGFLNAMNA (SEQ ID NO: 69);
- (e) FFRLLFHGVHHGGGYLNAA (SEQ ID NO: 70);
- (f) FFRLLFHGVHHVGKIKPRA (SEQ ID NO: 71);
- (g) GWKSVFRKAKKVGKTVGGLALDHYL (SEQ ID NO: 72);

- (h) GWKKWFNRAKKVGKTVGGLAVDHYL (SEQ ID NO: 73);
- (i) GWRTLLKKADEVKTVGKLALKHYL (SEQ ID NO: 74);
- (j) AGWGSIFKHIFKAGKFIHGAIAHND (SEQ ID NO: 75);
- (k) GFWGKLFKLGLHGIGLLHLHL (SEQ ID NO: 76);
- (l) GWKKWLRKGAKHLGQAAIK (SEQ ID NO: 77);
- (m) GWKKWLRKGAKHLGQAAIKGLAS (SEQ ID NO: 78);
- (n) GWKKWFTKGERLSQRHFA (SEQ ID NO: 79);
- (o) FLGLLFHGVHHVGKWIHGLIHGHH (SEQ ID NO: 80);
- (p) GFLGILFHGVHHGRKKALHMNSERRS (SEQ ID NO: 81);
- (q) FLGFLFHGIHHGIRAIHLIHG (SEQ ID NO: 330);
- (r) FFGALIKGAIHGGKLLHKLIKKHEHHGYGKHWG (SEQ ID NO: 331);
- (s) FLGFLFHGIRHGKAIHGMIHG (SEQ ID NO: 332);
- (t) GKGRWLERIGKAGGIIIGGALDHLG (SEQ ID NO: 333);
- (u) GLGNWMGPHISGEKKALHMNSERRS (SEQ ID NO: 334);
- (v) GLGNWIVRPIGGEKKALQMNSERRS (SEQ ID NO: 335);
- (w) LFGKFLKKVHAGTSIGETALHVAEHHGLHAHHG (SEQ ID NO: 336);
- (x) GLGNWMGPHISGRKKALHMNSERRS (SEQ ID NO: 337);
- (y) FLGLLFHGVHHVGKLIHGLIHG (SEQ ID NO: 338);
- (z) ARWGTFFKHIFKAGRFIHGAIAHNDG (SEQ ID NO: 339);
- (aa) AWIPALNRIYHGALLRINRQMYYRRHWHG (SEQ ID NO: 340);
- (ab) AWMPALNRIYHGALLRINRQMYYRRHWHG (SEQ ID NO: 341);
- (ac) GWKKWFTKGAKHLGQAAINGLAS (SEQ ID NO: 342);
- (ad) GWKKWLRKGAKHLGQAAIKGLAS (SEQ ID NO: 343);
- (ae) FGDFYMKPGRKISHGYIRSPYG (SEQ ID NO: 344);
- (af) GYWRFRNHRGERLSQRHFA (SEQ ID NO: 345);

- (ag) FGMLFHRVHHAGRLIHRFIKRHG (SEQ ID NO: 346);
- (ah) IFGLIATAVHNAGRLIHRLLGFHHGPPGFWHG (SEQ ID NO: 347);
- (ai) IFGLIATAVHNVGRLVHGLLGFHHGPPGFWHG (SEQ ID NO: 348);
- (aj) IFGLIATAVHNVGRLVHGLLGFHHGPPRFWHG (SEQ ID NO: 349);
- (ak) FFGMRFHGVHHAGGGFLNAQGLLPSLLLNPgyRG (SEQ ID NO: 350);
- (al) FFGALLKGAQALHGIIHNARHG (SEQ ID NO: 351);
- (am) GWKDWFRKAKKVGKTVGGLALNHLYG (SEQ ID NO: 352);
- (an) GIRKWFKKAHVGVGKVALNACL (SEQ ID NO: 353);
- (ao) GLKKWFKKAVHVGKKGKVALNAYLG (SEQ ID NO: 354);
- (ap) GWRKWIKKATHVKGKHIGKAALDAYIG (SEQ ID NO: 355);
- (aq) GCKKWFKKAAHVGVGKVALNAYLG (SEQ ID NO: 356);
- (ar) GIRKWFKKAHVGVGKVALNAYLG (SEQ ID NO: 357);
- (as) WLERKWFKKATHVKGKHVGKAALDAYLG (SEQ ID NO: 358);
- (at) FFGLLFHGIHHAGKLIHGLIHHG (SEQ ID NO: 359);
- (au) LGNWMGPHISGRKKALQMNSERRS (SEQ ID NO: 360);
- (av) FLGLLFHGVHHVGNLIHGLIHHG (SEQ ID NO: 361);
- (aw) GIRKWFKKAHVGVGKKGKVALNAYLG (SEQ ID NO: 362);
- (ax) a C-terminally amidated or otherwise C-terminally or N-terminally modified peptide of (a) to (z) or (aa) to (aw);
- (ay) a C-terminally amidated peptide of (a) to (z) or (aa) to (aw) where modification replaces C-terminal G; and
- (az) a peptide of (a) to (z) or (aa) to (aw) comprising ~~at least~~ one conservative amino acid substitution or deletion of ~~an~~ one amino acid residue thereof.

46. (Withdrawn) An isolated nucleotide sequence encoding a peptide of claim 45.

47. (Withdrawn) An isolated antimicrobial peptide selected from the group consisting of:

(a) MKTFSVAVAVVVVLACMFILESTAVPFSEVRTEEVESIDSPVGEHQQ-PGGTSMNLPMHFRFKRQSHLSLCRWCCNCCHNKGCGFCKF (SEQ ID NO: 174);

(b) MKTFSVAVAVVVVLACMFILESTAVPFSEVRTEEVESIDSPVGEHQQ-QPGGTSMNLPMHFRFKRQSHLSLCRWCCNCCHNKGCGFCKF (SEQ ID NO: 175);

(c) MKAFSVAVVLVIACMFILESTAVPFSEVRTEEVGSF DSPVGEHQQP-GGESMHLPEPFRFKRQIHLSLCGLCCNCCHNIGCGFCKF (SEQ ID NO: 176);

(d) RTEEVE SIDSPVGEHQQ PGGTSMNLPMHFRFKRQSHLSLCRWCC-NCCHNKGCGFCKF (SEQ ID NO: 177);

(e) MKTFSVAVVPVIACMFILESTAVPFSEVRTEEVGSF DSPVGEHQQP-GGTSMNLPMHFRFKRQSHLSLCRWCFNCCHNKGCGFCKF (SEQ ID NO: 178);

(f) MKQFSVAVVLVMA CMFIVESTAVPFSEVRTEEVGS LDSPVGEHQQ-PGGESMHLPEPFRFKRQIHLSLCGLCCNCCHNIGCGFCKF (SEQ ID NO: 179);

(g) MKAFSIAVAVTLVLAFVCIQCSSAVPFQGVQEELEEAGGNDTPVAEH-QVMSMESWMENPTRQKRHISHISLCRWCCNCCKANKGCGFCKF (SEQ ID NO: 180);

- (h) MKTFSVAVAVTLVLAFVCIQDSSAVPFQGVQELEEAGGNDTPVAAH-QMMSMESWMESPVRQKRHISHISMCRWCCNCCKAKGCGPCKF (SEQ ID NO: 181);
- (i) MKTFSVAVTVAVVLVFICIQSSGTFPEVQELEEAVSNDNAAAEHQ-ETSVDSWMPYNRQKRAFKCKFCCGCCRAGVCGLCKF (SEQ ID NO: 182);
- (j) MKTFSVAVTVAVVLVFICIQSSASFPEAQELEEAVSNDNAAAEHQ-ETPVDSWMPYNRQKRSFKCKFCCGCCRAGVCGLCKF (SEQ ID NO: 183);
- (k) MKTFSVAVTVAVVLVFICIQSSASFPEAQELEEAVSNDNAAAEHQ-ETPVDSWMPNNRQKRGFKCKFCCGCCRAGVCGLCKF (SEQ ID NO: 184);
- (l) MKTFSVAVTVAVVLVFICIQSSATFPEMPYNRQKRGFKCKFCCGCCGAGVCGMCKF (SEQ ID NO: 185);
- (m) MKTFSVAVTVAVVLVFICIQSSASFPEAQELEEAVSNDNAAAEHQ-ETPVDSRIPYNRQKRSFKCKFCCGCCRAGVCGLCKF (SEQ ID NO: 186);
- (n) MKTCSVAVTVAVVLVFICIQSSASFPEVQELEEAVSNDNAAAEHQ-ETPVDSWMPNNRQKRGFKCKFCCGCCRAGVCGLCKF (SEQ ID NO: 187);
- (o) MKTISVAVTVAVVLVFICIQSSASFPEAQELEEAVSNDNAAAEHQ-ETPVDSGMIPYNRQKRSFKCKFCCGCCRAGVCGLCKF (SEQ ID NO: 188);
- (p) MKTFSGAVTVAVVLVFICIQSSASFPEVQELEEAVSNDNAAAEHQ-ETPVDSWMPNNRQKRGFKCKFCCGCCRAGVCGLCKF (SEQ ID NO: 189);
- (q) MKTSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAHHQ-ETSVDSWMPYNRPKRSFKCKFCCGCCRA-GVCGLCKF (SEQ ID NO: 190);
- (r) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQ-ETSVDSWMPYNRPKRSFKCKFCCGCCRAGVCGLCKF (SEQ ID NO: 191);
- (s) MKTFVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQ-ETSVDSWMPYNRQKRSFKCKFCCGCCRAGVCGLCKF (SEQ ID NO: 192);

- (t) MKTSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAAHQ-
ETSVDSWMPYNNRQKRSFKCKFCCGCCRAGVCGLCCKF (SEQ ID NO: 193);
- (u) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQ-
ETSVDLWMPYNNRQKRGFKCKFCCGCCSPGVCGLCCRF (SEQ ID NO: 194);
- (v) MKTFSVAVAVAVVLIFICIQSSATFPEVQELEEAVSNDNAAAEHQE-
TSLDSWMPYNNRQKRGFKCKFCCGCCRAGVCGLCCKF (SEQ ID NO: 195);
- (w) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQ-
ETSLDSWMPYNNRHKRSFKCKFCCGCCRAGVCGLCCKF (SEQ ID NO: 196);
- (x) MKTFSVAVTVAVVLVFICIQSSATFPEVQELGEAVSNDNAAAEHQ-
ETSVDSWMPYNNRPKRSFKCKFCCGCCRAGVCGLCCKF (SEQ ID NO: 197);
- (y) MKTFSVAVTVAVVLIFICIQSSATSPEVQGLEEAVSNDNAAAEHQ-
ETSVDSWMPYNNRQKRGFKCKFCCGCCRPGVCGLCCRS (SEQ ID NO: 198);
- (z) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQ-
ETSVDLWMPYNNRQKRGFKCKFCCGCCRPGVCGLCCRF (SEQ ID NO: 199);
- (aa) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEH-
QETSVDL-WMPYNNRQKRGFKCKFCCGCCSPGVCGLCCRF (SEQ ID NO:
200);
- (ab) KTFVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQET-
SVDS-WMPYNNRQKRGFKCKFCCGCCSPGVCGLCCKF (SEQ ID NO: 201);
- (ac) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEH-
QETSVDS-WMPYNNRQKRGFKCKFCCGCCRPGVCGLCCKF (SEQ ID NO:
202);
- (ad) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQ-
ETSVDSWMPYNNRQKRGFKCKFCCGCCRPGVCGLCCKF (SEQ ID NO: 203);

- (ae) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQ-
ETSVDSWMPYNRQKRGFKCKFCCGCCRPVCGLCCKF (SEQ ID NO: 204);
- (af) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSSDNAAAEHQ-
ETSVDSWMPYNRQKRSFKCKFCCGCCRRGVCGLCCKF (SEQ ID NO: 205);
- (ag) MKTISVAVTVAVVLLFICTQQSSATFPEVQELEEAVSSDNAAAEHQ-
ETSVDSWMPYNRQKRGFKCKFCCGCRCGALCGLCCKF (SEQ ID NO: 206);
- (ah) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEPVSSDNAAAEH-
QETSVDSWMPYNRQKRGFKCKFCCGCRCGALCGLCCKF (SEQ ID NO: 207);
- (ai) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSSDNAAAEHQ-
ETSVDSWMPYNRQKRGFKCKFCCGCRCGALCGLCCKF (SEQ ID NO: 208);
- (aj) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQ-
ETPVDSGMMPNNRQKRSADCWPCCNQNGCGTCCKV (SEQ ID NO: 209);
- (ak) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEH-
QETSVDSWMPYNRQKRSAECSFCCNESGCGICCKF (SEQ ID NO: 210);
- (al) MKTFSVAVTVAVVLVFICIQSSATFPEVQELEEAVSNDNAAAEHQ-
ETSVDSWMPYNRQKRSAECSFCCNESGCGICCKF (SEQ ID NO: 211);
- (am) MPNNRQKRGSNCKPCCNHNGCGTCCEV (SEQ ID NO: 363);
- (an) a C-terminally amidated peptide (a) to (z) or (aa) to (am); and
- (ao) a peptide of (a) to (z) or (aa) to (am) comprising at least one conservative amino acid substitution of an amino acid residue thereof.

48. (Withdrawn) An isolated nucleotide sequence encoding a peptide of claim

47.

49. (Previously Presented) An isolated polypeptide of claim 38, wherein the initial peptide is a hepcidin.

50. (Previously Presented) An isolated polypeptide of claim 38, wherein the initial peptide is a pleurocidin.